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ANCHOR QEA

Memorandum

~~August 7, 2017~~August 23, 2017

To: Sean Sheldrake, U.S. Environmental Protection Agency, Region 10

From: Ryan Barth, Anchor QEA, LLC

cc: Bob Wyatt, NW Natural
Patty Dost, Pearl Legal Group
Dana Bayuk, Oregon Department of Environmental Quality
Myron Burr, Siltronic Corporation
Michael Murray, Maul Foster & Alongi
Carl Stivers, Ben Hung, and John Verduin, Anchor QEA, LLC

Re: Revised NW Natural Proposed Summer 2017 Interim~~itial~~ Pre-Remedial Design Data Gaps Field Sampling – Gasco Sediments Site

As discussed with the U.S. Environmental Protection Agency (EPA) during a meeting on August 3, 2017, NW Natural requests approval from the EPA to perform an interim~~itial~~ round of pre-design data collection at the Gasco Sediments Site in ~~late August and~~ early September 2017. NW Natural proposes that this interim~~itial~~ data collection event occur during this timeframe to take advantage of annual low river water surface water elevations and to help inform the more comprehensive data gaps sampling event that will be proposed in the *Draft Pre-Remedial Design Data Gaps Work Plan and Sampling and Analysis Plan* we expect to submit to EPA in late 2017 or early 2018, in accordance with the EPA-approved Gasco Sediments Site revised Schedule of Project Deliverables (Anchor QEA 2017). NW Natural understands that the more comprehensive data gaps sampling event will include additional sampling locations and media to support a broader set of data objectives. This interim~~itial~~ data collection event is not intended to modify the process for determination of data objectives and uses described in NW Natural's *Pre-Remedial Basis of Design Technical Evaluations Work Plan* (Work Plan; Anchor QEA 2017).

This interim~~itial~~ data collection event will include the deployment of seepage meters to collect empirical data for offshore groundwater seepage at the Site in accordance with EPA's request in its letter dated April 4, 2017 (EPA 2017), and the data gaps sampling proposed in the Work Plan. Groundwater seepage data collection is ideal during the late summer and early fall (i.e., August through October) because the low river surface water elevations relative to high upland groundwater elevations result in the highest potential groundwater seepage fluxes. Empirical measurements of groundwater seepage were previously conducted at the Site by both the Lower Willamette Group (LWG) in August 2005 (Integral 2005) and by NW Natural in October 2007 (Anchor Environmental 2007). However, these collection efforts occurred prior to operation of the hydraulic control and containment (HC&C) system installed as part of the upland source controls for the Gasco property.

During this proposed event, NW Natural will measure groundwater seepage during similar low river surface water elevations and while the HC&C system is operating at full scale.

~~In addition to seepage meter deployment, NW Natural proposes to collect transition zone water (TZW; porewater), near-bottom surface water, and surface sediment samples co-located with the seepage meters to further inform the more comprehensive data gaps sampling plan that will be proposed in the *Draft Pre-Remedial Design Data Gaps Work Plan and Sampling and Analysis Plan* and support forthcoming remedial design evaluations presented in the Work Plan. The proposed sampling methodologies for each of these media will be consistent with the methodologies previously executed at the Site pursuant to EPA-approved quality assurance project plans (QAPPs) and field sampling plans (FSPs).~~

The remainder of this memorandum summarizes the scope of work for all proposed sampling activities and provides references to the previously EPA-approved quality assurance plans (QAPPs) and field sampling plans (FSPs).

Offshore Groundwater Seepage Meters

NW Natural proposes to deploy the identical type of seepage meter used by the LWG and NW Natural during the 2005 and 2007 groundwater seepage investigations, respectively, to obtain empirical data on zones of groundwater discharge and recharge at the Site. A detailed description of these meters and the type of data that will be obtained is provided in the *Portland Harbor RI/FS Round 2 Groundwater Pathway Assessment Sampling and Analysis Plan – Attachment 1 Field Sampling Plan Groundwater Plume Discharge Mapping* (Integral 2005). In summary, the meters are ultrasonic seepage meters available through Coastal Monitoring Associates (CMA) located in San Diego, California. Ultrasonic seepage meters are capable of time-series flow rate measurement, which captures both positive and negative seepage at the surface water-sediment interface. Conductivity, temperature, and pressure measurements may also be recorded from sensors mounted on the meter to support the seepage flux evaluations.

NW Natural proposes the deployment of six seepage meters in the offshore area of the Site that will be submerged during predicted summer river surface elevations. The target locations are shown in Figure 1, and the coordinates are listed in Table 1. The locations were determined based on the total number of available seepage meters (six) from CMA, co-location with ~~four~~ three offshore locations previously sampled by LWG and NW Natural, areas that showed a large range of positive/negative fluxes prior to installation of the HC&C system, and spatial coverage of the offshore area of the Site that includes both capping and dredging remedial technologies identified in the Record of Decision. The seepage meters need to be deployed in at least 5 feet of river water to remain submerged during deployment, so each of the target locations are limited to the offshore portion of the Site, as shown in Figure 1. Groundwater seepage data from additional locations in the nearshore area of the

Site should also be collected during the winter months with higher river surface elevations. Deployment of seepage meters at additional nearshore locations throughout the Site will be proposed in the more comprehensive *Pre-Remedial Design Data Gaps Work Plan and Sampling and Analysis Plan* for consideration by EPA.

Research Support Services (RSS) divers will deploy the seepage meters with oversight and equipment provided by CMA. CMA and RSS are ~~is~~ available to deploy the seepage meters in ~~late August and~~ early September 2017. ~~All meters will be deployed by~~RSS is a certified dive team, and the meters will be deployed under ~~an~~ the EPA-approved *Dive Safety and Work Plan* (RSS 2017)~~diver Health and Safety Plan~~. ~~EPA has previously reviewed and approved CMA diver Health and Safety Plans developed for work performed at the Site for both the LWG and NW Natural.~~ NW Natural proposes deployment of each seepage meter for a period of 2 to 3 days (the maximum battery duration for the meters), consistent with past Site deployments, to update groundwater seepage variations over multiple tidal cycles. The proposed seepage meter discharge flow measurement, decontamination, and field documentation procedures will be performed consistent with the *Portland Harbor RI/FS Round 2 Groundwater Pathway Assessment Sampling and Analysis Plan – Attachment 1 Field Sampling Plan Groundwater Plume Discharge Mapping* (Integral 2005).

~~TZW and Near-Bottom Surface Water~~

~~NW Natural proposes to collect TZW and near-bottom surface water co-located with the six proposed seepage meters. The LWG and NW Natural have previously collected TZW samples at the Site using a variety of sampling equipment, including piezometers, "Trident" probes, and Geoprobe water samplers. Trident probes were developed by CMA, who will perform the seepage meter deployment, and were successfully used to collect TZW samples by the LWG in 2005. Therefore, NW Natural proposes to use Trident probes for this proposed sampling event.~~

~~The proposed Trident probe sampling will be conducted in accordance with the sampling, decontamination, quality control (QC), sample handling, and field documentation procedures detailed in the *Portland Harbor RI/FS Round 2 Groundwater Pathway Assessment Sampling and Analysis Plan – Attachment 1 Field Sampling Plan Groundwater Plume Discharge Mapping* (Integral 2005). In summary, the Trident probe is a simple, direct-push system equipped with temperature, conductivity, and water sampling probes. The Trident Probe will be deployed by a diver. The sampling port will be inserted 30 cm below the mudline, consistent with previous TZW sampling events at the Site. TZW will be extracted from the Trident probe using a low-flow peristaltic pump. The probe and sampling tube will be purged of approximately three volumes before samples are collected. During purging and sampling, the TZW will be simultaneously monitored for temperature and conductivity to determine if river water is infiltrating the sediment and diluting the TZW.~~

Unfiltered (total) samples of the constituents listed in Table 2 will first be collected. If sufficient sample volume is available, samples will also be collected for filtered (dissolved) phase analyses. If sufficient volume is available, filtering will be performed in the analytical laboratory as soon as possible upon receipt using either centrifugation and/or a 0.5-micron glass fiber filter. Volatile organic compounds (VOCs) will not be filtered; only total VOCs will be analyzed. Observations of turbidity or suspended sediments in the TZW samples will be recorded in the field notes, and if sufficient sample volume remains after all total and dissolved species have been collected, total suspended solids (TSS) will also be analyzed from an unfiltered sample. The guidelines for sample handling and storage are provided in Table 3.

Co-located near-bottom surface water samples will be collected approximately 1 foot above the riverbed concurrently with the TZW samples. An additional pumping tube will be attached to the Trident probe, and its intake will be positioned 1 foot above the seal plate of the Trident probe assembly. Similar to the TZW samples, the near-bottom surface water will also be collected using a low-flow peristaltic pump. The sampling tube will be purged of approximately three volumes before samples are collected. Unfiltered (total) samples of the constituents listed in Table 2 will be collected. No filtered (dissolved) samples will be collected except for dissolved organic carbon. The filtering will be performed in the analytical laboratory as soon as possible upon receipt using either centrifugation and/or a 0.5-micron glass fiber filter.

Surface Sediment

In addition to the co-located TZW and near-bottom surface water samples, NW Natural proposes to collect a single surface sediment sample co-located with each of the six proposed seepage meters. NW Natural most recently collected surface sediment samples using a van Veen sampling device in 2010, as outlined in the EPA-approved *Final Project Area Identification Report and Data Gaps QAPP* (Project AIR; Anchor QEA 2010). In summary, the van Veen grab sampler will be lowered to the mudline, the cable will be drawn taut to collect the sample, and the sampler will be retrieved aboard the vessel and evaluated for acceptance using the acceptability criteria. Immediately following opening of the grab, a representative sample to be analyzed for VOCs will be collected from the upper 1 foot of sediment using a clean, stainless-steel spoon and placed into a laboratory-provided sample container. The sample will then be photographed and logged, and any present debris will be removed. The upper 1 foot of sediment from inside the van Veen grab sampler, without touching the sidewalls, using a decontaminated stainless-steel trowel or equivalent will be collected, placed into a single decontaminated stainless-steel bowl, and completely homogenized. The laboratory-provided sample containers will be filled with the homogenized sediment.

Sediment collection, sample processing, sample handling, field quality assurance (QA)/QC sampling, field documentation, decontamination, and investigation derived waste procedures are described in detail in the Project AIR, and the proposed surface sediment sampling will be performed consistent

~~with the procedures. The surface sediment samples will be analyzed for the specific analytes, methods, reporting limits, and detection limits in Table 4 to support sediment remedial design consistent with the Record of Decision requirements. In addition, a few additional analyses will be performed to assist with polycyclic aromatic hydrocarbon (PAH) source identification. The additional PAH data will be submitted to EPA concurrent with the data used for remedial design purposes. Table 5 presents the guidelines for sample handling and storage for collected sediment.~~

~~Data Quality Objectives and QA/QC Sampling~~

~~The primary data quality objective for this initial round of data collection is to ensure that the data collected are of known and acceptable quality. The quality of the laboratory data is assessed by precision, accuracy, representativeness, comparability, and completeness (also known as the "PARCC" parameters). Definitions of these parameters and the applicable QC procedures are included in the Project AIR (Anchor QEA 2010). To expedite EPA's review of this proposal, reproduced herein are the applicable quantitative goals for these data quality parameters in Table 6 for TZW and near-bottom surface water and in Table 7 for surface sediment. Field and laboratory QA/QC procedures are also detailed in the Project AIR. Copies of the Laboratory QC Sample Analysis Frequency and Field QC Samples Acceptance Criteria for all proposed sampling media are presented in Tables 8 and 9, respectively.~~

References

Anchor Environmental (Anchor Environmental, L.L.C.), 2007. Letter to: Dana Bayuk, Oregon Department of Environmental Quality. Regarding: Proposed Groundwater Seepage Meter Deployment Scope of Work – Gasco Site. August 22, 2007.

Anchor QEA (Anchor QEA, LLC), 2010. *Final Project Area Identification Report and Data Gaps QAPP*. Prepared for the U.S. Environmental Protection Agency. Prepared on behalf of NW Natural. July 2010.

Anchor QEA, 2017. *Pre-Remedial Basis of Design Technical Evaluations Work Plan*. Prepared for the U.S. Environmental Protection Agency. Prepared on behalf of NW Natural. July 2017.

EPA (U.S. Environmental Protection Agency), 2017. Letter to: Bob Wyatt, NW Natural, and Myron Burr, Siltronic Corporation. Regarding: Gasco Groundwater Modelling Report, NW Natural Site. April 4, 2017.

Integral (Integral Consulting, Inc.), 2005. *Portland Harbor RI/FS Round 2 Groundwater Pathway Assessment Sampling and Analysis Plan – Attachment 1: Field Sampling Plan Groundwater Plume Discharge Mapping*. Prepared for the Lower Willamette Group. July 1, 2005.

RSS (Research Support Services), 2017. *Dive Safety and Work Plan: UltraSeep Deployment*. Prepared for Anchor QEA. August 2017.

Tables

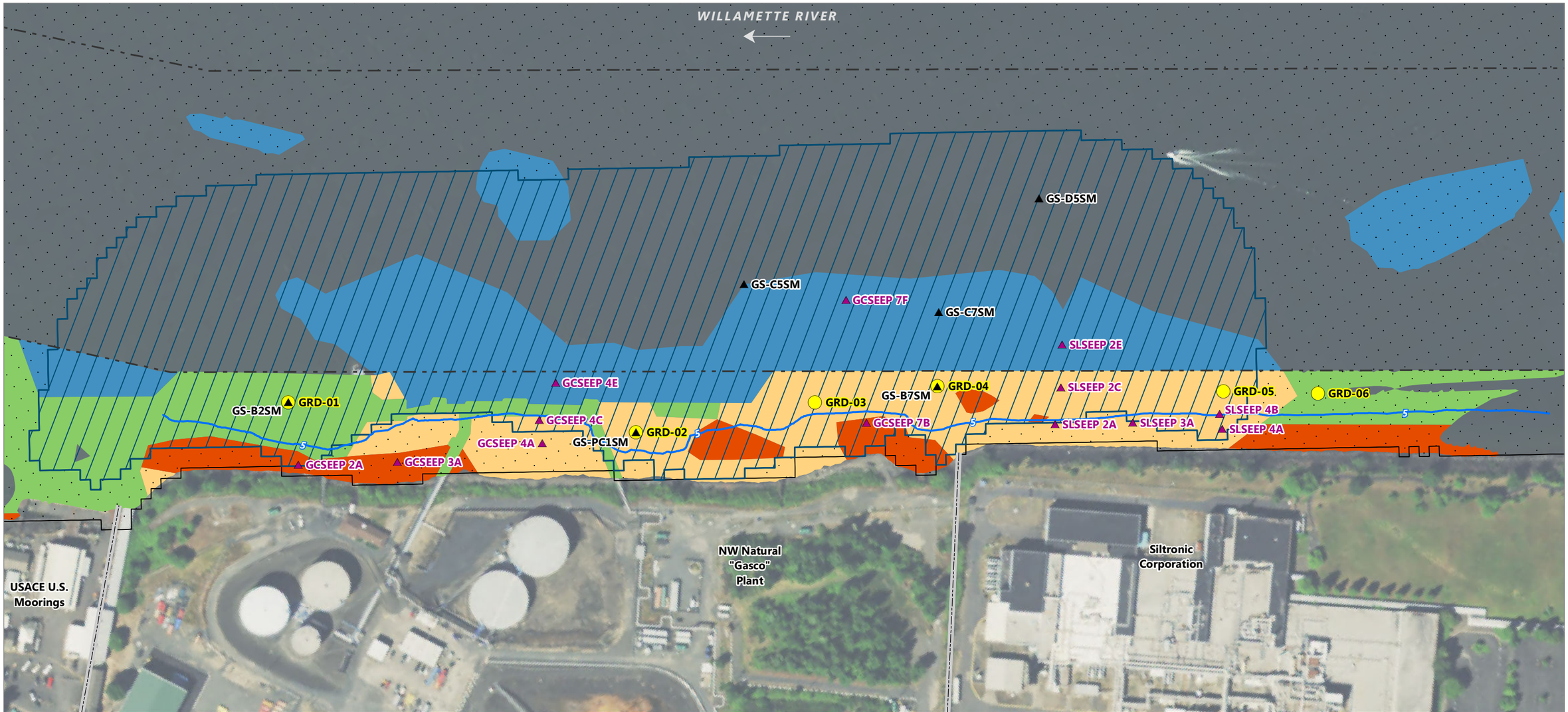
Table 1

Proposed Seepage Meter Locations

Station ID	Latitude (NAD83)	Longitude (NAD83)
GRD-01	45.58108110	-122.7604816
GRD-02	45.58000756	-122.7582451
GRD-03	45.57967074	-122.7569223
GRD-04	45.57942072	-122.7560316
GRD-05	45.57862673	-122.7541195
GRD-06	45.57836384	-122.7534873

Note:
NAD83: North American Datum of 1983

Figure



LEGEND:

- Navigation Channel
- Property Line

ROD Technology Assignment

- Cap
- Dredge
- Dredge in Nav-FMD
- Dredge with Cap

- Proposed Seepage Meter Location
- NW Natural Gasco Seepage Meter (2007)
- LWG Seepage Meter (2005)
- Average 5-foot Water Depth (July-October)

Simulated Groundwater Advective Flux Direction[1]

- Groundwater to River
- River to Groundwater

NOTES:

1. The groundwater advective flux shown was simulated using a steady-state MODFLOW groundwater flow model based on the average boundary conditions from February 2016. The model includes HC&C pumping, but does not simulate any fill remedy. The MODFLOW model was presented in the Gasco Groundwater Modeling Report dated February 17, 2017, and was reviewed and approved by Oregon Department of Environmental Quality (DEQ) for the upland Gasco property source control evaluation.
2. HC&C = Hydraulic control and containment.
3. Arrow indicates direction of flow of river.
4. Horizontal datum is NAD83 HARN Oregon State Plane North, Intl. Feet.
5. Vertical datum is City of Portland, feet.
6. Aerial imagery from 2014 NAIP.

0 200
Feet

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Figure 1
Proposed Seepage Meter Locations
Revised Summer 2017 Interim Pre-Design Data Gaps Sampling Proposal
Gasco Sediments Cleanup Action